DOCUMENT RESUME

ED 197 513 EC 131 715

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TITLE	Diagnostic Decision Making in Individuals Susceptible to Biasing Information Presented in the Referral Case Folder.
INSTITUTION	Minnesota Univ., Minneapolis. Inst. for Research on Learning Disabilities.
SPONS AGENCY	Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
REPORT NO	IRLD-RR-26
PUB DATE	Mar 80
CONTRACT	300-77-0491
NOTE	25p.; For related documents, see EC 131 709-720.
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Bias; Classification; *Decision Making; *Disabilities; Exceptional Child Research; *Referral; Student Characteristics; Student Evaluation

ABSTRACT

The extent to which computer simulated classification decisions within special education were differentially affected by information presented at the time of the referral was investigated. Decisions about 16 different cases were evaluated and found to be a function of referral information rather than child performance data. The outcomes are discussed with regard to implications for the practice of psychoeducational assessment. (Author)

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Research Report No. 26

DIAGNOSTIC DECISION MAKING IN INDIVIDUALS SUSCEPTIBLE TO BIASING INFORMATION PRESENTED IN THE REFERRAL CASE FOLDER

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EC131715

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I. Adequacy of Norm-Referenced Data for Prediction of Success

II. Computer Simulation Research on the Assessment/Decision-making/Intervention Process

III. Comparative Research on Children Labeled LD and Children Failing Academically but not Labeled LD

IV. Surveys on In-the-Field Assessment, Decision Making, and Intervention

V. Ethological Research on Placement Team Decision Making

VI. Bias Following Assessment

VII. Reliability and Validity of Formative Evaluation Procedures

VIII. Data-Utilization Systems in Instructional Programming

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March, 1980

SEP 2 2 1980

Abstract

Teacher-student interactions and, to some extent, educational decision making have been shown to be influenced by naturally-occurring student characteristics. The extent to which computer simulated classification decisions within special education were differentially affected by information presented at the time of the referral was investigated. Decisions about 16 different cases were evaluated and found to be a function of referral information rather than child performance data. The outcomes are discussed with regard to implications for the practice of psychoeducational assessment.

Diagnostic Decision Making in Individuals Susceptible to Biasing Information Presented in the Referral Case Folder

Assessment of children in educational settings has become a common practice (Salvia & Ysseldyke, 1978; Ysseldyke & Algozzine, 1979); many issues have resulted from the decision-making activities in America's schools (Ysseldyke, 1979). For example, definitions of special education categories often are arbitrarily derived and/or prognostically useless (Algozzine & Sutherland, 1977; Hallahan & Kauffman, 1977; Ysseldyke & Algozzine, 1979). Additionally, it has been argued that the entire decision-making process is biased (Ysseldyke, 1979; Ysseldyke & Algozzine, 1979). This research addresses one aspect of bias in assessment: the extent to which individuals, who find a hypothetical child eligible for special placement, are influenced by data presented at time of referral.

Teachers exert considerable influence upon the intellectual, academic, and personal-social development of the children in their classrooms; differences in characteristics and behaviors of children have been shown to produce differential teacher expectations and interactions (Algozzine, 1975; Brophy & Good, 1974; Foster, 1976; Sutherland, 1976). Brophy and Good (1974) suggested that susceptibility to "teacher expectation effects" was an individual difference variable which required research so that more productive teacher-pupil matching might be possible.

Teacher expectancy effects and bias on a number of factors have been demonstrated in a variety of settings. For example, Palardy (1969) showed that reading performance was related to teachers' expectations for a child's ability to learn to read; Algozzine (1977) found that teacher

perceived attractive and unattractive children were treated differently; Sutherland and Algozzine (1979) reported that girls labeled as learning disabled were treated differently from those labeled as normal. Similar outcomes have been demonstrated for a variety of other factors (Bergan & Smith, 1966; Berscheid & Walster, 1974; Brophy & Good, 1974; Dion, 1972; Dusek, 1975; Giesbrecht & Routh, 1979; Jackson & Lahaderne, 1967; LaVoie & Adams, 1974; Lenkowsky & Blackman, 1968; Rubovits & Maehr, 1973; Ysseldyke & Algozzine, 1979). Teacher-pupil interactions and, to some extent, educational decision making are influenced by student characteristics; the extent to which classification decisions within special education were differentially affected by information presented at time of referral was investigated here.

Method

Subjects. A total of 159 school professionals participated in the computer simulation study. The subjects were divided into two groups based upon their decisions regarding eligibility. Those (N = 83) who indicated that the referred child was "eligible" for special services (i.e., recorded 1 or 2 on eligibility question) were selected for more detailed analysis in this study. The subjects represented a broad spectrum of disciplines and experience in providing services in educational settings. For example, 12 school psychologists, 25 special education teachers, 5 school administrators, 31 regular class teachers and 10 other school personnel were included in the sample; their average age was 42 years (SD = 9.60), and the average number of years of teaching experience was approximately 12. Fifteen males (18%) and 68 females (82%) participated. Most were from suburban districts (i.e., 86%); over 80 percent had at least a bachelor's or master's degree.

An analysis of these subjects' demographic characteristics indicated that they were older ($\bar{X}$ = 42.06, SD = 9.60; t = 3.06), had more years of regular class teaching experience ($\bar{X}$ = 9.13, SD = 9.24; t = 2.97), had taken fewer special education courses ($\bar{X}$ = 7.00, SD = 7.00; t = -2.48), and included more females and less males (X^2 = 3.88, df = 1, $p < .05$) than the group of individuals who did not find the child eligible. No differences were found in the number of years of experience with special children or in non-teaching activities, or in the numbers of statistics or assessment classes taken; similarly, the two groups were similar in terms of current job title, type of school district in which employed, and the highest level of education obtained.

Procedure

Each of the participants was asked to read a case folder description and make some decisions about the child represented; additional information was made available via a computer terminal and interactive program. The simulation procedure enabled the subjects to select assessment devices from seven commonly utilized domains (e.g., intelligence, achievement, perceptual-motor) in order to collect information of a diagnostic nature about the child presented in the case folder. The archive of test performance information contained scores indicative of average performance in all areas of behavior sampled. Subjects were randomly assigned to one of 16 experimental conditions reflecting variations in the referral information received in the case folder.

Referral conditions. Different case descriptions were prepared by varying selected information in the folders. The name was listed as William or Phyllis to vary the child's sex. In half of

the cases, the child's father was presented as a bank vice-president and the mother as a realtor; in the other eight conditions, the father was a bank janitor and the mother a check-out clerk at a local supermarket. The type of presenting problem in the folders was either academic or behavioral in nature. Previously judged photographs of "attractive" or "unattractive" children were attached to the case folders to vary the child's appearance. Thus, under one condition, a subject might receive information about an attractive female from a high SES family who had been referred because of a behavior problem; under another condition, the child was represented as an unattractive male from a low SES family who had been referred for academic problems; and so on.

Dependent variables. Subjects were asked to complete a series of questions after they had reviewed the case folder and accessed additional information of their choice about the child. Of interest to this study were four questions: the first requested subjects to indicate the extent to which they believed the referred child was eligible for special education services; the others requested information on the extent to which the participant thought the child was mentally retarded, learning disabled, or emotionally disturbed. All responses were recorded on Likert-type scales in which 1 = very likely and 5 = very unlikely. Additionally, the number of devices selected from each domain available was recorded.

Design and data analysis. For purposes of hypotheses testing, a four factor (2X2X2X2) multivariate analysis of variance design was utilized; sex, SES, type of problem, and appearance were the independent variables and three diagnostic classification decisions were the dependent variables.

Significant multivariate effects were subjected to univariate analyses of variance for each dependent variable separately and further simple effects were analyzed using *t* tests as appropriate. Significant univariate main effects were interpreted from *F* ratios since all factors contained only two levels of variation. The level of significance for all tests was set at .05 and an additional criterion of at least a 0.5 unit difference between means was established in an attempt to separate trivial from important outcomes. This latter criterion represented a 10 percent unit difference and was approximately one-half the average standard deviation for all data.

Results

Differences in numbers of devices selected according to domains of information sampled (e.g., achievement, intelligence, etc.) were evaluated. A visual inspection of these differences suggested that most could be dismissed as trivial (i.e., mean differences of less than one device were observed). For each type of child, the total number of devices selected for intelligence, achievement, perceptual-motor, language, adaptive-behavior and personality assessment was similar; however, approximately twice as many behavior ratings were selected for the child thought to have behavior problems than for the child with academic problems. In making their decisions, subjects selected tests from each domain available; approximately half of their choices were for intellectual (21%) and achievement (29%) measures. Perceptual-motor tests (13%), behavior ratings (13%), personality tests (11%), language tests (8%), and measures of adaptive behavior (5%) were selected to a lesser extent.

Means and standard deviations for subjects' diagnostic classification decisions are posted in Table 1 according to the type of child presented in the referral information. The multivariate analysis of variance for these data yielded three significant effects; the Wilks' lambda for the four factor interaction was 0.89 ($F = 2.81$, df = 3.65, $p < .05$), suggesting that the multivariate decision centroids differed for different types of children as portrayed in the 16 referral statements. Similarly, the Wilks' lambda for the sex by SES by type of problem interaction was significant ($F = 2.92$, $p < .05$), as was that indicating differences in diagnostic decisions for children thought to have academic or behavior problems ($F = 3.21$, $p < .05$).

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Insert Table 1 about here

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Univariate follow-up analyses indicated that (a) children with "academic problems" were less likely to be diagnosed as emotionally disturbed ($\bar{X} = 3.8$) than children thought to have behavior problems ($\bar{X} = 3.1$), (b) no significant differential effects were present within the diagnostic classifications related to mental retardation, and (c) a four-factor interaction was present within decisions about classifying the child as learning disabled. This latter outcome suggested that the effects of three types of the referral information differed according to the level of the fourth type of information. To facilitate interpretation of this complex interaction, a two-stage procedure was undertaken.

Initially, each level of referral information (e.g., male or low SES or unattractive or behavior problem, etc.) was held constant and the effects of each other factor analyzed. This enabled an analysis of the

three factor interactions to be completed for each level of all factors taken separately. Significant three factor interactions were then subjected to more detailed analysis of individual cell means; any analysis in which the highest order interactions was not significant was analyzed for lower order effects.

The results of the analyses of the eight three factor interactions are presented in Table 2; significant three factor interactions were indicated for girls, low SES children, children with behavior problems, and unattractive children. Significant two factor interactions (i.e., Sex X SES) were indicated for children with academic problems and attractive children; analysis of the former was precluded by involvement in several higher order interactions and results of the latter (involving attractive children) were dismissed as trivial since no differences were greater than the 0.5 unit difference established for importance.

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Insert Table 2 about here

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The comprehensive nature (i.e., involving at least one level of all factors) of these three factor interactions was suggestive of specific differences in the extent to which children were classified as learning disabled. To further evaluate the outcomes, individual cell means were analyzed. Subjects' ratings of the likelihood of various types of children being LD are presented in Table 3 in order of magnitude (least likely to most likely). Application of criteria for significance yielded several differences between cases; case types which share a common subscript in Table 3 were considered similar.

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Insert Table 3 about here

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As is evident in Table 3, a variety of specific differences in the extent to which a child was thought to be LD emerged, reflecting the complex interaction of attractiveness, SES, sex, and problem for which the child was referred. In general, the decision makers rated the child as likely ($\bar{X}$ = 2.2) to be learning disabled. However, some exceptions to this generalization are apparent in Table 3. For example, certain girls with behavior problems (unattractive, low SES: $\bar{X}$ = 3.6; attractive, high SES: $\bar{X}$ = 3.2) were less likely to be "diagnosed" as LD. Other girls with behavior problems (unattractive, high SES: $\bar{X}$ = 1.7; attractive, low SES: $\bar{X}$ = 2.2) were more likely to be diagnosed as LD. Girls with academic problems were thought to be LD ($\bar{X}$ = 1.9) regardless of SES or appearance. Those children most likely to be diagnosed as LD had academic problems or were unattractive children with behavior problems (with the exception of unattractive, low SES girls with behavior problems).

Discussion

Educational decision makers were presented referral information varying on the basis of the student's sex, socioeconomic status, physical attractiveness, and nature of difficulty for which a student was referred. They were provided an opportunity to select various kinds of assessment information and were then asked to make decisions regarding the student's eligibility for services and diagnostic classification. The extent to which different assessment information was selected as a function of referral information was evaluated, and the extent to which different kinds of information were perceived as influ-

ential in decision making by professionals susceptible to bias was analyzed.

For the most part, participants in this computer simulation study selected tests in a similar manner regardless of the information presented at the time of referral. This suggests that a relatively standard procedure is followed by educational decision makers when they engage in psychoeducational assessment; and, to some extent, one would hope to find a form of "standardized objectivity" in the process.

In spite of the similar nature of the information collected, both qualitatively and quantitatively, different decisions were made about the child (who was portrayed as average in all test performance data). Approximately 52 percent of the participating subjects found the child eligible for special education services; these subjects were older and differed on other demographic characteristics from subjects who did not find the child eligible. Additionally, the diagnostic classification decisions of these individuals were a function of a variety of naturally-occurring student characteristics.

Decisions to classify the child as emotionally disturbed were more likely when the referral statement indicated behavior problems. It is important to note that no evidence to confirm those behavior problems was included in the behavioral assessment data accessed by the participants. No evidence of mental retardation appeared in the referral information or performance data and no differential decisions regarding the likelihood of that diagnosis were observed. Decisions to classify the child as learning disabled were based on a variety of specific factors. Certain children (e.g., unattractive, low SES girls referred for

academic problems) were much more likely to be diagnosed as LD than others (e.g., unattractive, low SES girls referred for behavior problems).

A variety of naturally-occurring student characteristics have been shown to influence the formation of negative attitudes toward students; many student characteristics (i.e., race, behavior, sex of child, socioeconomic status, etc.) differentially affect the transmission of classroom teachers' expectations (Brophy & Good, 1974: Dusek, 1975; Ysseldyke & Algozzine, 1979). It seems, then, that even before a child utters a response to a test item, the assessment cards may be unfavorably stacked. The exact nature of this psychoeducational contrivance is as yet undetected. One possibility is that different assessment processes may be selected for different types of youngsters; another is that examiners may hold, and seek to confirm (with or without appropriate evidence), preconceived notions about the assessment outcomes based upon the child's "characteristics." The results of this research seem to support the latter: that is, in spite of average performance and as a function of selected child characteristics, differential diagnostic decisions were made by certain school personnel. Whether the outcomes will generalize (or currently exist) in the real world, the indictment suggested is serious.

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Footnote

Bob Algozzine is also Associate Professor, Department of Special Education, University of Florida, Gainesville. The authors wish to express appreciation to Virginia Ross and Leila Cantara for professional assistance in preparation of the manuscript and Matt McGue for constructive criticism of early versions of the material.

Table 1

Means and Standard Deviations of Diagnostic Classification Decisions About Each Type of Child

Referral Information[a]				Diagnostic Classification[b]		
Sex	SES	Prob	Appear	MR	LD	ED
Male	Hi	Acad	Attrac	4.8(0.4)	1.8(0.4)	4.0(0.7)
			Unattr	5.0(0.0)	1.7(0.6)	3.0(1.7)
		Behav	Attrac	4.8(0.4)	2.2(0.8)	3.3(1.5)
			Unattr	4.5(0.6)	2.0(0.8)	2.5(1.7)
	Lo	Acad	Attrac	4.6(0.5)	2.6(1.3)	3.6(1.1)
			Unattr	4.6(0.5)	2.8(0.8)	3.6(0.5)
		Behav	Attrac	4.8(0.4)	2.4(0.5)	2.8(1.3)
			Unattr	4.8(0.5)	1.9(0.8)	2.8(1.0)
Female	Hi	Acad	Attrac	4.7(0.5)	2.0(0.8)	3.9(0.9)
			Unattr	4.0(1.5)	2.3(0.8)	3.0(1.4)
		Behav	Attrac	5.0(0.0)	3.2(1.0)	3.8(1.2)
			Unattr	5.0(0.0)	1.7(0.6)	3.3(0.6)
	Lo	Acad	Attrac	4.8(0.4)	1.6(0.8)	4.2(0.8)
			Unattr	4.8(0.4)	1.6(0.9)	4.2(1.1)
		Behav	Attrac	5.0(0.0)	2.2(0.8)	3.0(1.6)
			Unattr	4.2(1.3)	3.6(1.1)	3.0(1.6)

[a] Referral information included child's sex, SES, referral problem (academic or behavioral), and appearance (attractive or unattractive).

[b] Means represent scores ranging from 1 (very likely) to 5 (very unlikely).

Table 2

Results of Post Hoc Three Factor Analyses

for Each Level of Other Factors

Factor	Level	Outcome	
Sex	Male	all effects	$p > .05$
	Female	SES x PROB x APP	$p < .05$, $F = 9.28$
		PROB	$p < .05$, $F = 9.50$
SES	High	all effects	$p > .05$
	Low	APP x PROB x SEX	$p < .05$, $F = 4.13$
		PROB x SEX	$p < .05$, $F = 10.13$
Problem	Academic	SES x SEX	$p < .05$, $F = 6.34$
	Behavior	APP x SES x SEX	$p < .05$, $F = 9.01$
		SES x APP	$p < .05$, $F = 4.25$
		SEX	$p < .05$, $F = 6.86$
Appearance	Attractive	SES x SEX	$p < .05$, $F = 4.47$
	Unattractive	SES x PROB x SEX	$p < .05$, $F = 11.61$
		PROB x SES	$p < .05$, $F = 5.73$

Table 3

Extent to Which Case was Thought to Be Learning Disabled

Type of Child	$\bar{X}$[a]	Sig.[b]
Unattractive low SES girl with behavior problem	3.6	h
Attractive high SES girl with behavior problem	3.2	gh
Unattractive low SES boy with academic problem	2.8	fg
Attractive low SES boy with academic problem	2.6	ef
Attractive low SES boy with behavior problem	2.4	def
Unattractive high SES girl with academic problem	2.3	cdef
Attractive low SES girl with behavior problem	2.2	bcde
Attractive high SES girl with academic problem	2.0	bcde
Unattractive high SES boy with behavior problem	2.0	abcd
Unattractive low SES boy with behavior problem	1.9	abcd
Attractive low SES girl with academic problem	1.8	abc
Attractive high SES boy with academic problem	1.8	abc
Unattractive high SES girl with behavior problem	1.7	ab
Unattractive high SES boy with academic problem	1.7	ab
Unattractive low SES girl with academic problem	1.6	a

[a] Score range was 1 (very likely) to 5 (very unlikely)

[b] Nonsignificant differences were found between cases with the same subscript letters.

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